

29 CFR 1910.33 – 38

Exit Routes and Emergency Action Plans



Triangle Shirtwaist Factory

New York City, 1911

- At 4:40pm, on March 25th, everyone was preparing to leave. Mostly women and girls ages 16-23 worked 12 hour shifts.
- Building had been declared “Fireproof”.
- Blouses hung from wires stretched above. From one end to the other
- Boxes filled with cloth and lint next to sewing stations
- Work stations packed together
- Machine oil stored on the floor

Triangle Shirtwaist Factory

New York City, 1911

- The Blaze
 - Lasted only 30 Minutes
 - Fire companies arrived to dropping bodies (50 had jumped 100ft.)
 - Water from hoses only reached the seventh floor
 - Ladders only reached the sixth and seventh floors.
 - Elevators doors opened, allowing fresh air to enter the upper floors
 - 2 Fire escapes. No ladders. Collapse

Triangle Shirtwaist Factory New York City, 1911

- The Blaze (cont.)
 - Interior fire exit – Locked Doors
 - Other fire exits – Inward opening doors.
 - 150 escaped to the roof and the adjacent NY Law School
 - 8th floor human bridge

Triangle Shirtwaist Factory

New York City, 1911

- Aftermath
- 146 workers killed (700 had been working between the 8th and 10th floors.)
- Fireproof?
- 36 new workplace health and safety statutes enacted.
- Beginning of the birth of Life Safety Code
- Unions banded together for other safety and health issues
- More building requiring automatic sprinklers.

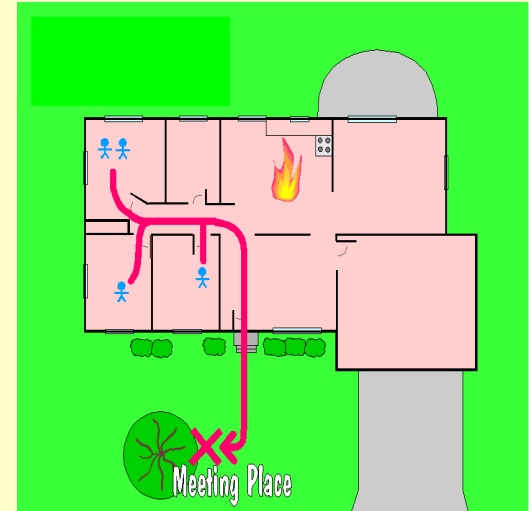
Introduction

- **Fires and explosions kill more than 200** and injure more than 5,000 workers each year
- There is a **long and tragic history** of workplace fires in this country caused by problems with fire exits and extinguishing systems
- OSHA requires employers to provide **proper exits, fire fighting equipment, and employee training** to prevent fire deaths and injuries in the workplace



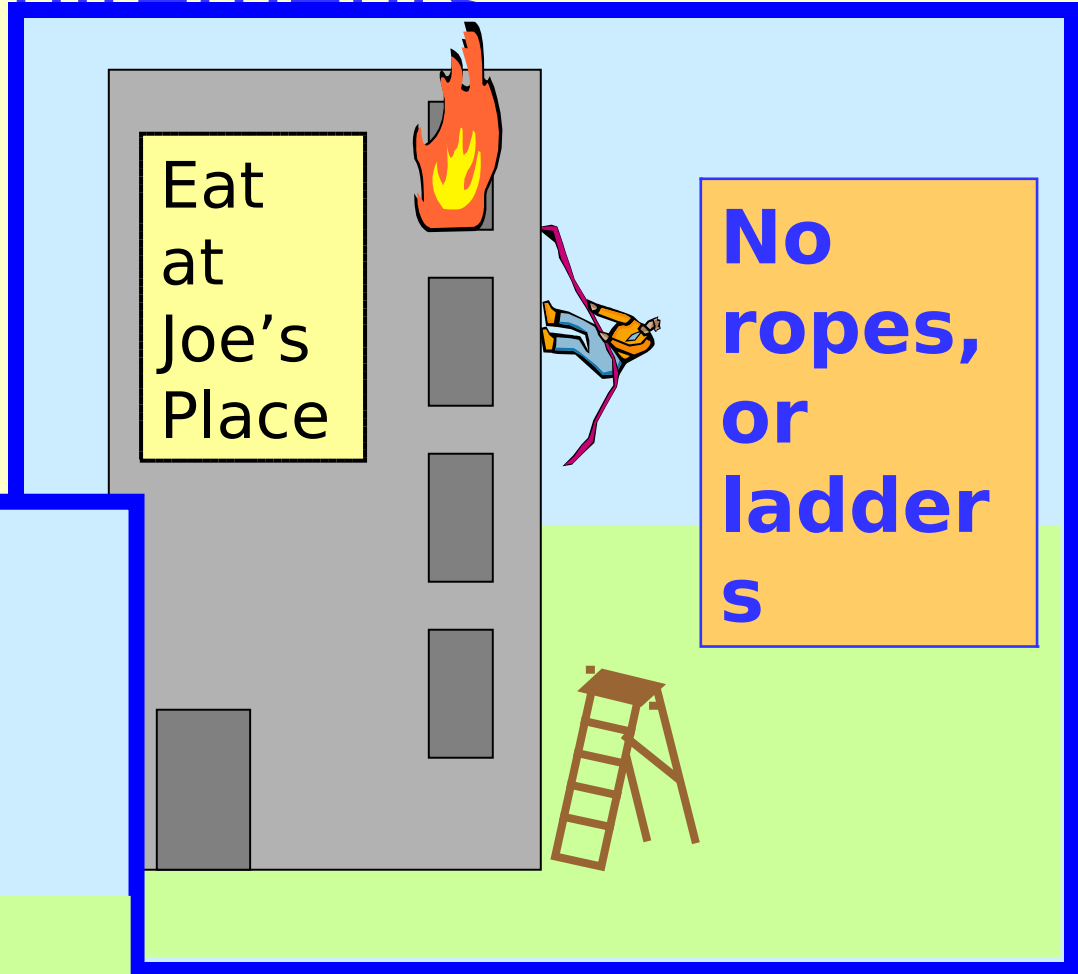
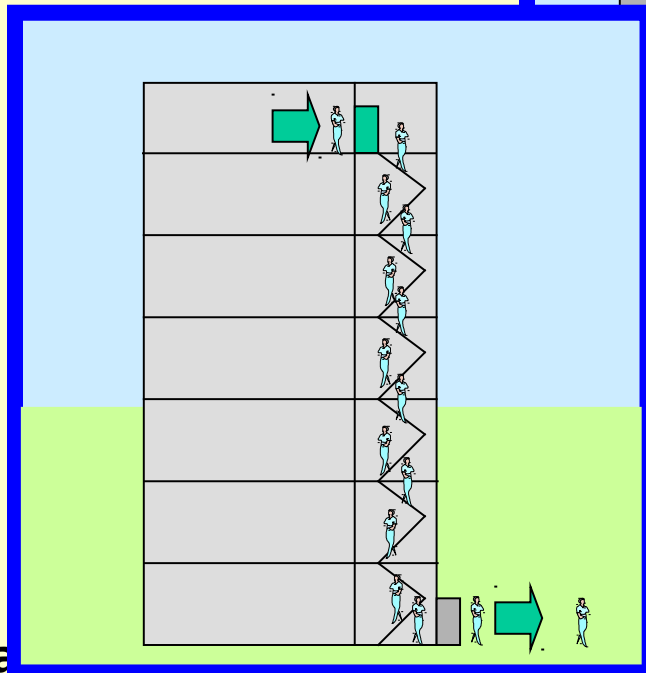
Exit Route

- A **continuous and unobstructed path of exit travel** from any point within a workplace to a place of safety (including refuge areas)
- Consists of three parts:
 - Exit access
 - Exit
 - Exit discharge
- Equivalent to the term **Means of Egress** in the Life Safety Code and most local building and fire codes



Exit Routes: Basic Requirements

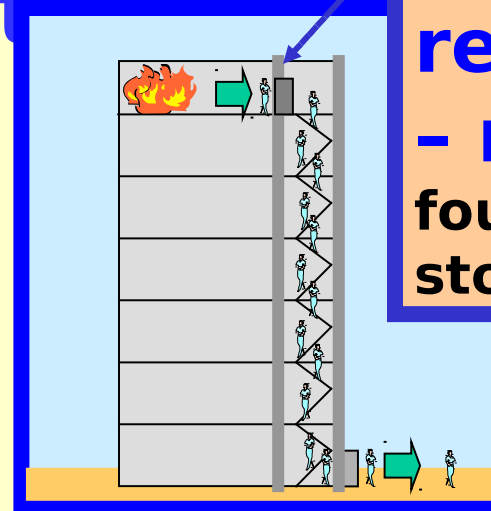
- Exit routes must be **permanent**



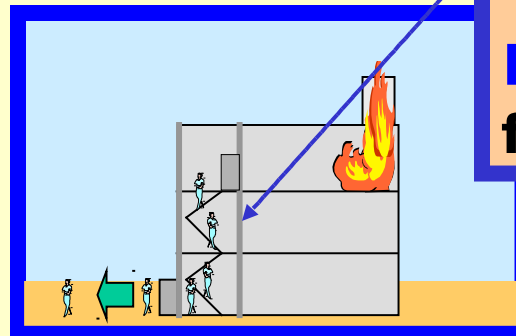
Exit Routes: Basic Requirements

An exit
must be
separated
by fire
resistant
material
s.

1910.36(a)(2)



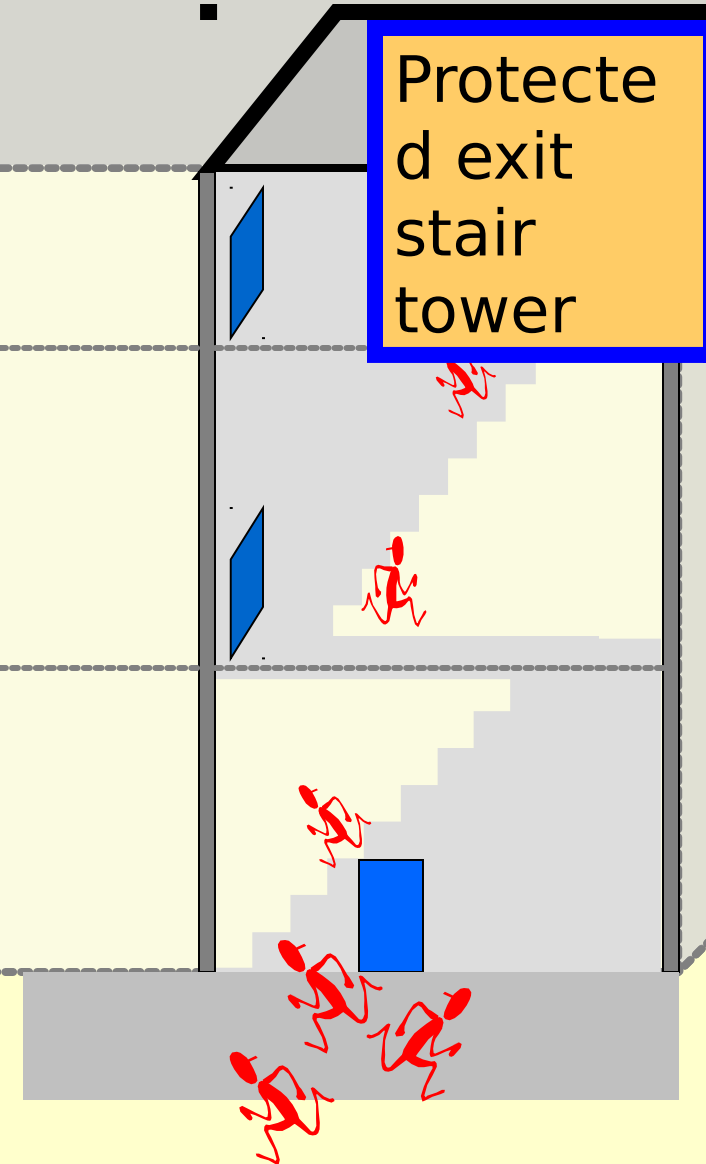
Exit enclosure
**Two - hour
fire
resistance
- rating** for
four or more
stories.



**One - hour fire
resistance -
rating:** three or
fewer stories

Exit Routes: Basic Requirements

- **Openings into an exit must be limited to those necessary to allow access to the exit or to the exit discharge**
- **An opening into an exit must be protected by an approved self-closing fire door that remains closed or automatically closes in an emergency**

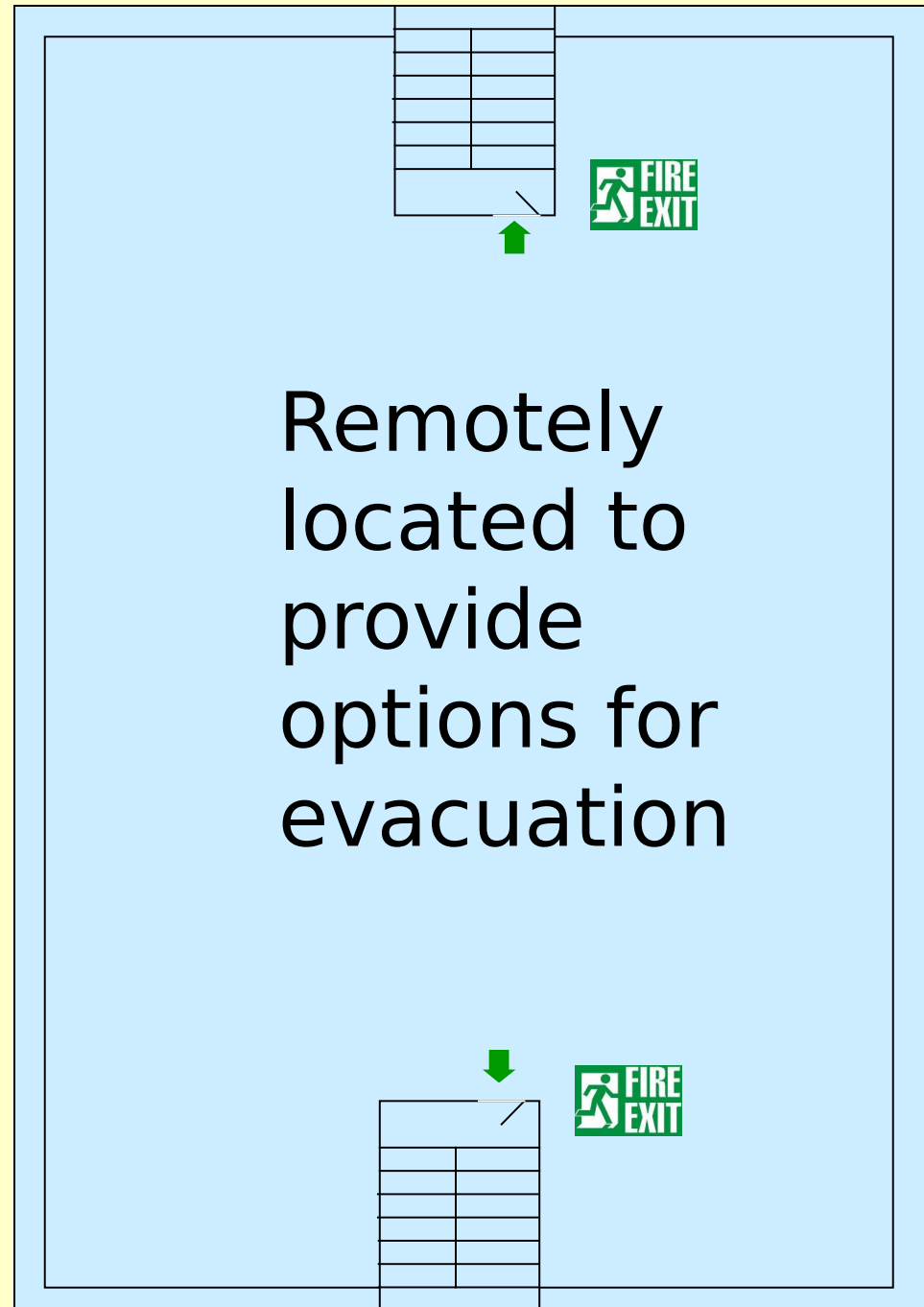


1910.36(a)(3)

**The number
of exit
routes must
Normally two or
more depending
on adequate.**

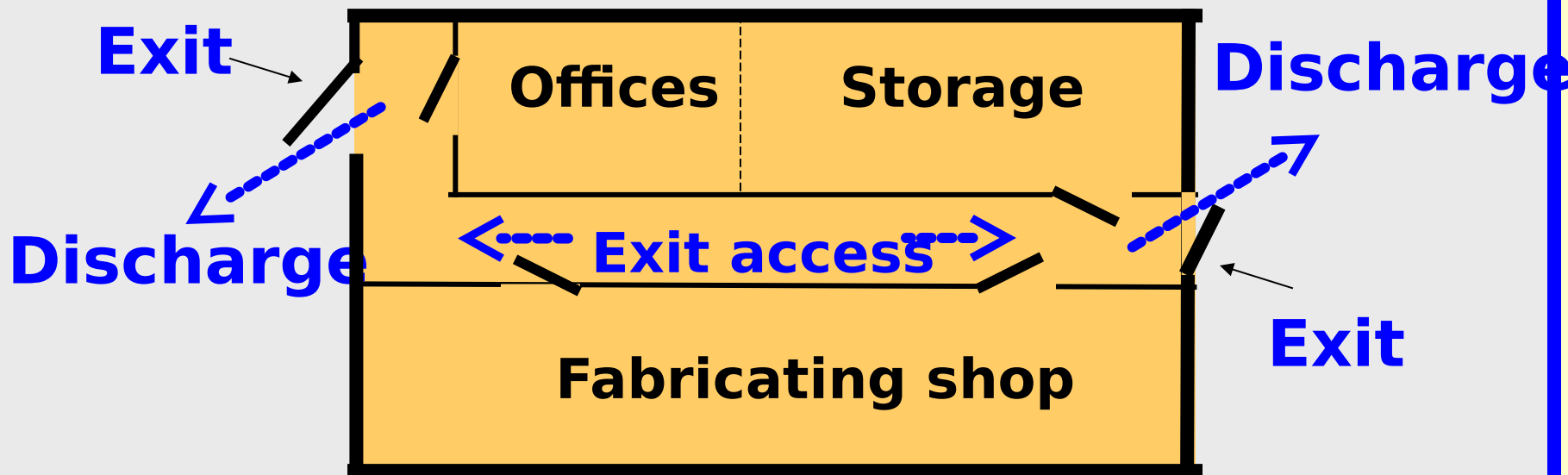
- the size of the building,
- its occupancy, or
- the arrangement of the workplace

1910.36(b)



Exit discharge

- . . . must lead directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside . . . (This area) must be



Exit discharge

Exit stairs that continue beyond the level on which the exit discharge is located must be **interrupted at that level by** doors, partitions, or other **effective means** that clearly indicate the direction of travel leading to the exit discharge.



1910.36 (c)(3)

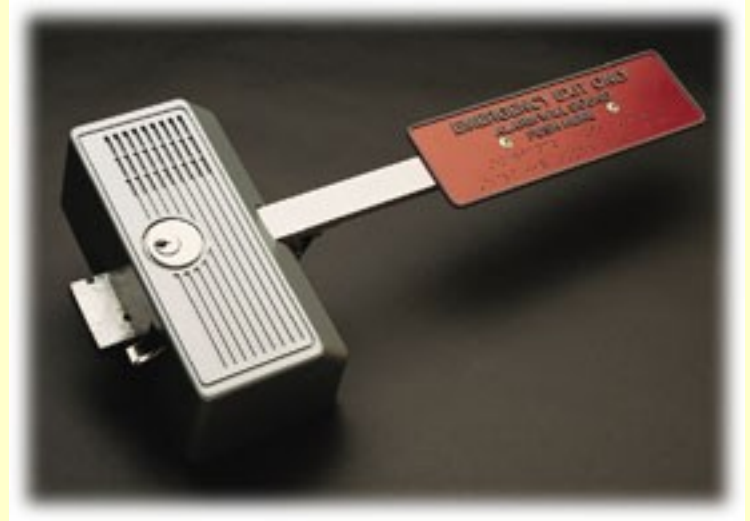
Exit Doors Must Be Unlocked

1910.36 (d)(1) and (2)

- **Must be able to open from the inside** at all times without
 - keys,
 - tools, or
 - special knowledge

Panic bars are permitted

Must be free of any device or alarm that could restrict emergency use if the device or alarm fails

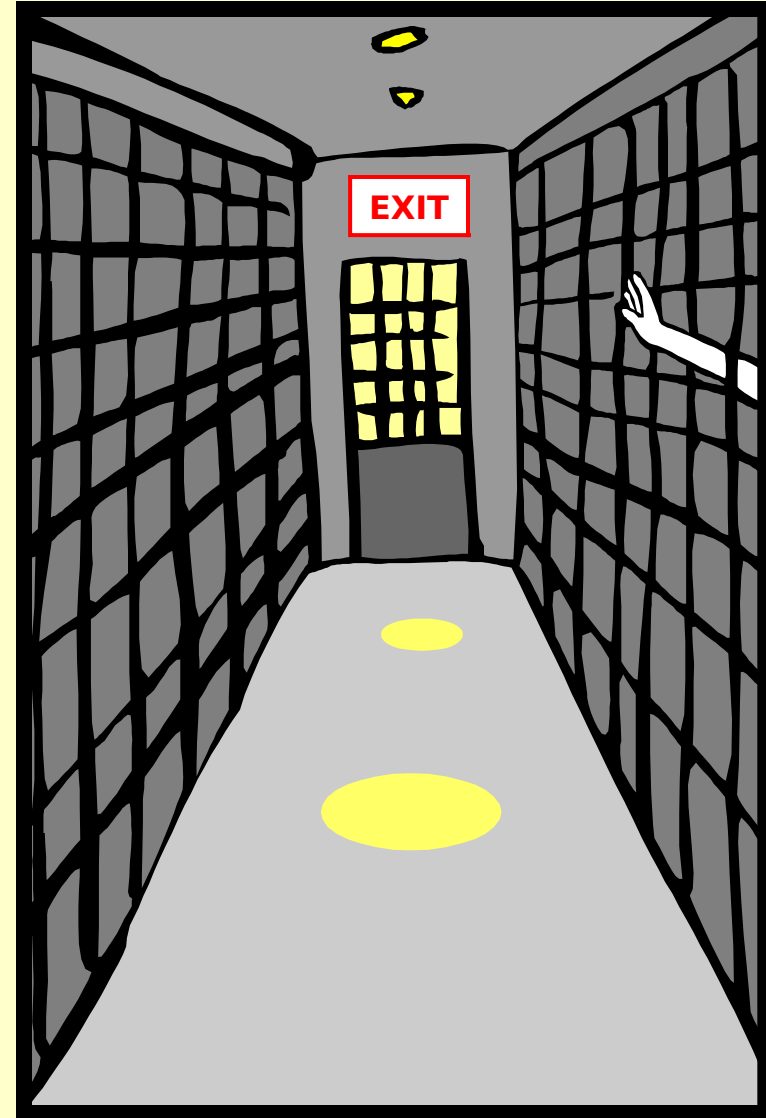


Exit Doors

May be locked from the
inside **only** in

- mental,
- penal, or
- correctional facilities
where there is constant
supervision and the
employer has a plan to
remove occupants from the
facility during an emergency.

1910.36 (d)(3)

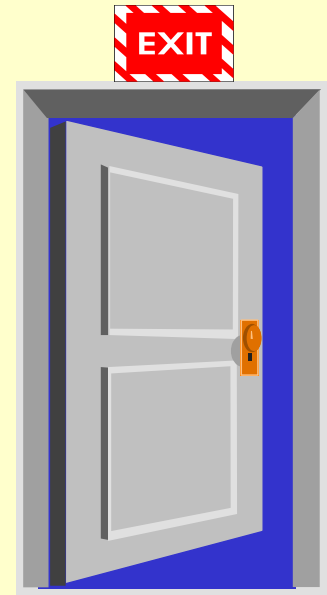


Side-Hinged Exit Door

Must be used to connect any room to an exit route

A door that connects any room to an exit route **must swing out in the direction of exit travel** if

- the room is designed to be occupied by **more than 50 people** or
- contains **high hazard contents**



1910.36 (e)(1) and (2)

Exit Route Capacity and Dimensions

Must support the maximum permitted **occupant load** for each floor served

See factors for occupant load and capacity the NFPA Life Safety Code -

1910.36 (f)(1)



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Exit Route Capacity and Dimensions

Capacity must not decrease in the direction of exit route travel to the exit discharge

1910.36 (f)(2)

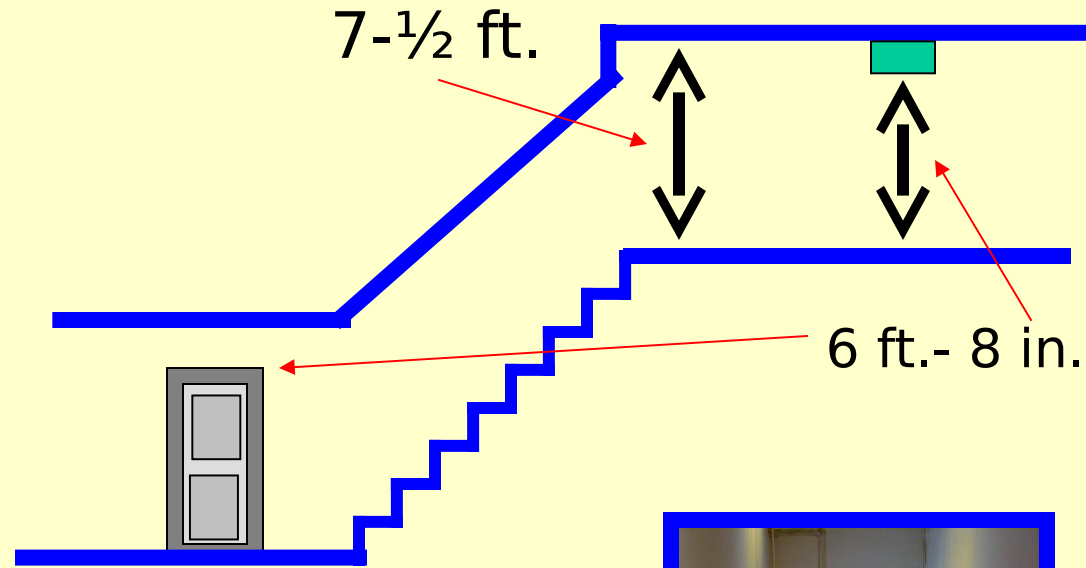


Handrail projection decreases capacity of this exit route



Exit Route Capacity and Dimensions

- Ceiling must be at least 7-½ ft. high with no projection reaching a point less than 6 ft.- 8 in. from floor
- An exit access must be at least 28 in. wide at all points



1910.36 (g)(1) and (2)

Exit Route Capacity and Dimensions

Objects that project into the exit route must not reduce the width of the exit route to less than the minimum width requirements for exit routes.



1910.36 (g)(4)

Minimize Danger to Employees

Exit routes must be kept free of explosive or highly flammable furnishings or other decorations



1910.37 (a)(1)

Minimize Danger to Employees

**Exit routes
must be
free and
unobstructed**

1910.37 (a)(3)



Minimize Danger to Employees

1910.37 (a)(2) and (4)

- Arrange exit routes so that employees will **not have to travel toward a high hazard area**, unless it is effectively shielded
- **Emergency** safeguards (e.g., sprinkler **systems**, alarm systems, fire doors, exit lighting) must be in proper **working** order at all times



Lighting and marking must be adequate and appropriate.

- Each exit must be clearly visible and marked with an “Exit” sign



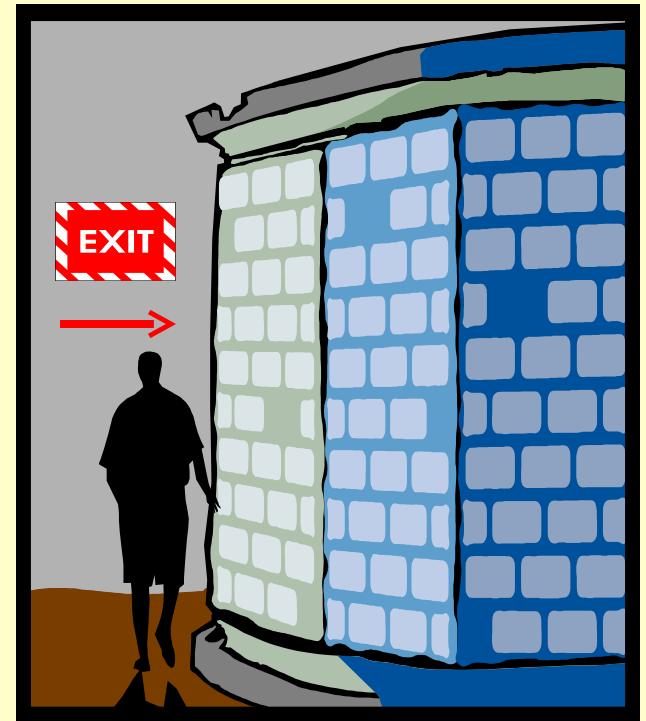
Lighting and marking must be adequate and appropriate.

- Each exit route door must be free of decorations or signs that obscure the visibility of the door



Lighting and marking must be adequate and appropriate.

- If the direction of travel to the exit or exit discharge is not immediately apparent, signs must be posted along the exit access indicating direction to the nearest exit
- The line-of-sight to an exit sign must clearly be visible at all times



Lighting and marking must be adequate and appropriate.

Each doorway or passage along an exit access that could be mistaken for an exit must be marked **“Not an Exit”** or similar designation, or be identified by a sign indicating its actual use (e.g., closet).



1910.37 (b)(5)

Lighting and marking must be adequate and appropriate.



Is this confusing?

Exit routes must be maintained during construction, repairs, or alterations

- • • Employees must not occupy a workplace until the exit routes • • • are completed and ready for employee use • • •



Building fully occupied

- Exit access enclosure doors wedged open
- Magnetic self-closing devices not installed

Exit routes must be maintained during construction, repairs, or alterations

Employees must not be exposed to hazards of flammable or explosive substances or equipment used during construction, repairs, or alterations, that are beyond the normal permissible conditions in the workplace, or that

W



1910.37 (d)(3)

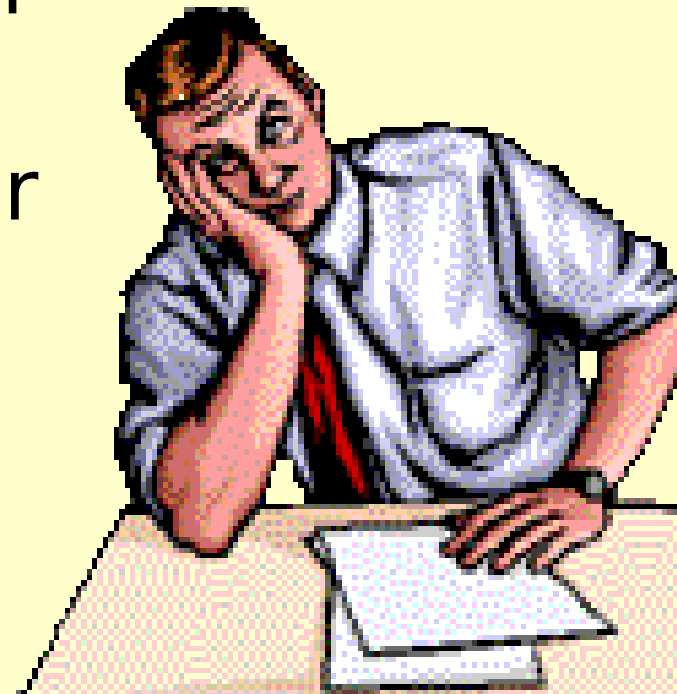


Contractor
supplies
stored in
exit stair
shafts

(b) Written and oral emergency action plans.

An emergency action plan must be in writing, kept in the workplace, and available to employees for review.

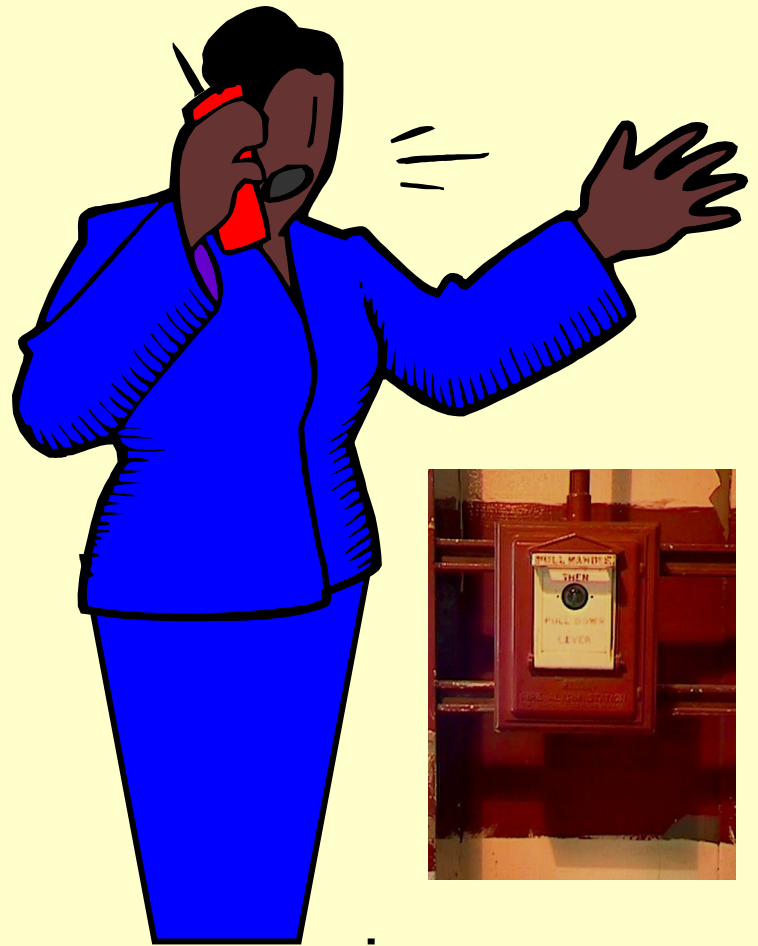
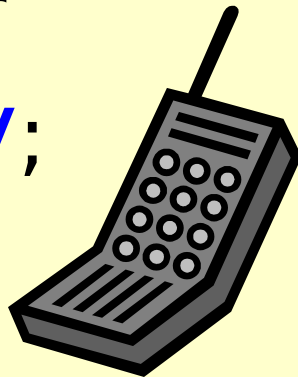
However, **an employer with 10 or fewer** employees may communicate the plan



(c) Minimum elements of an emergency action plan.

An emergency action plan must include at a minimum:

- (1) Procedures for reporting a fire or other emergency;



(c) Minimum elements of an emergency action plan.

(2) Procedures for emergency evacuation, including type of evacuation and exit route assignments;



(c) Minimum elements of an emergency action plan.

(3) Procedures to be followed by employees who remain to **operate critical plant operations** before they evacuate;



(c) Minimum elements of an emergency action plan.

(4) Procedures to account for all employees after evacuation;



Verify that employees are safe.

(c) Minimum elements of an emergency action plan.

(5) Procedures to be followed by employees performing rescue or medical duties; and



(c) Minimum elements of an emergency action plan.

(6) The name or job title of every employee **who may be contacted** by employees who need more information about the plan or an explanation of their duties under the plan.

What do I do??



We do this!



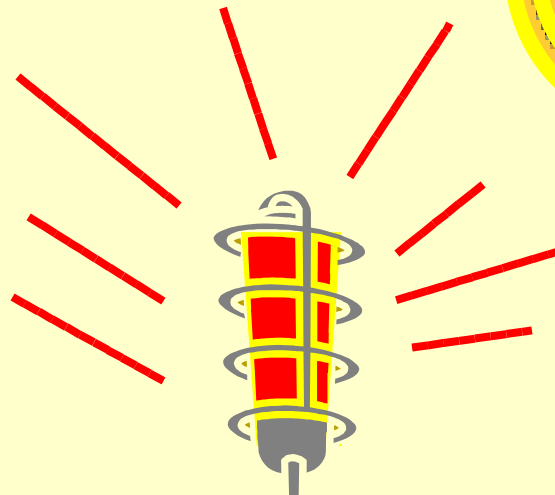
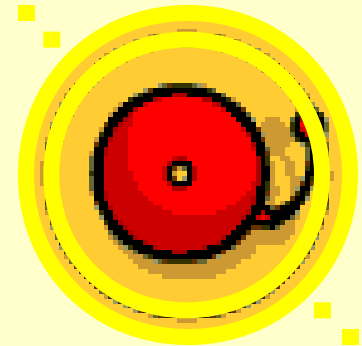
(d) Employee alarm system.

An employer must have and maintain an employee alarm system.



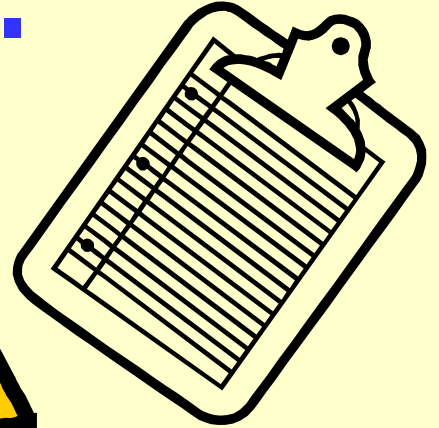
(d) Employee alarm system.

- ...The employee alarm system must use a **distinctive signal** for each purpose and **comply with** the requirements in § **1910.165**.



(e) Training.

An employer
must designate
and train
employees
to assist in a
safe and
orderly | ||
evacuation of
other
employees.



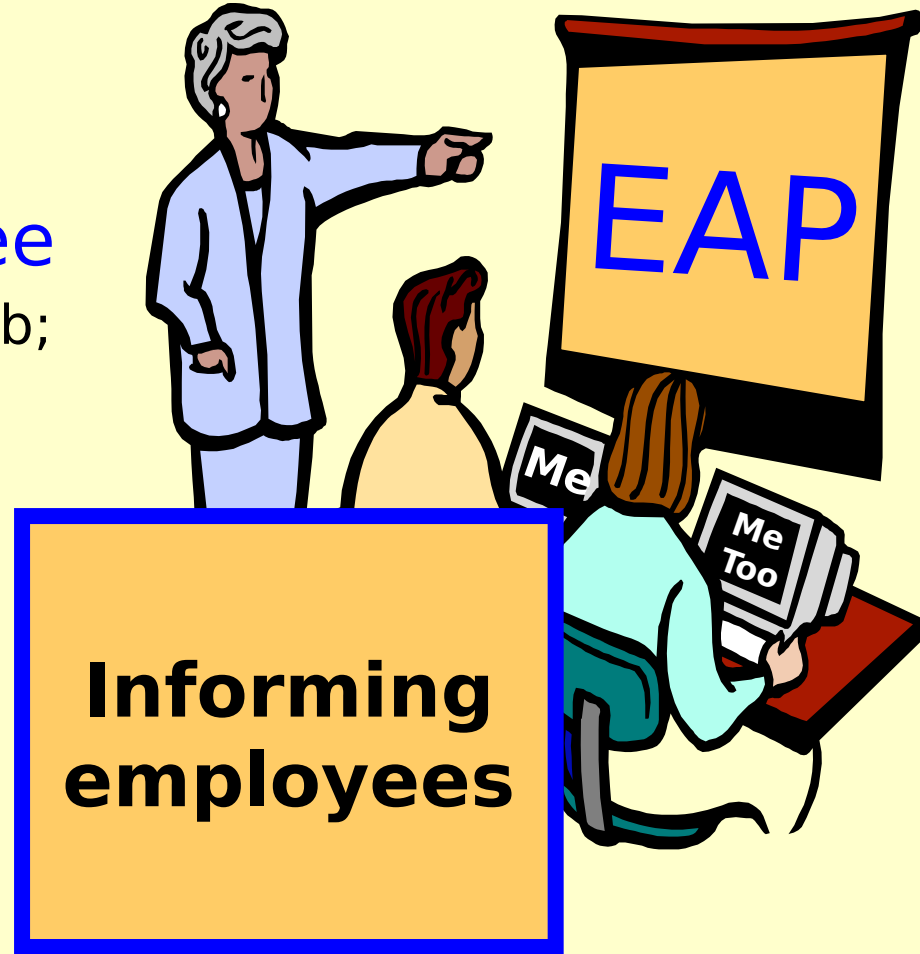
(f) Review of emergency action plan.

An employer must review the . . . EAP. . . with each employee covered by the plan:

(1) When the **plan is developed** or the **employee is assigned initially** to a job;

(2) When the employee's **responsibilities** under the plan **change**; and

(3) When the **plan is changed**.



1910.39 Fire Prevention Plans

- *Application*

- An employer must have a fire prevention plan when an OSHA standard in this part requires one
- The requirements in this section apply to each such fire prevention plan

1910.39 Fire Prevention Plans

- *Written and oral fire prevention plans*
- A fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review
- However, an employer with 10 or fewer employees may communicate the plan orally to employees

1910.39 Fire Prevention Plans

- *Minimum elements of a fire prevention plan*
- A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;
- Procedures to control accumulations of flammable and combustible waste materials;
- Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;
- The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and
- The name or job title of employees responsible for the control of fuel source hazards.

1910.39 Fire Prevention Plans

- *Employee information*

- An employer must inform employees upon initial assignment to a job of the fire hazards to which they are exposed
- An employer must also review with each employee those parts of the fire prevention plan necessary for self-protection